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Role of salinity and temperature in *Corbula amurensis* energetics in the upper San Francisco Bay Estuary

Abstract: Predicting impacts of non-native species on native communities and how this impact is modulated by environmental change requires an understanding of the energy requirements of the community members and how (strength, direction) energy flows through an ecosystem. The Asian clam, *Corbula amurensis*, invaded the San Francisco Estuary (SFE) in 1986 and has been implicated in the decline of native fish species by diverting of pelagic productivity to the benthos. We sought to characterize the energetic demands *C. amurensis* in the field and how they may fluctuate in response to natural seasonal variation in temperature, salinity, and food availability. We found metabolic rates of *C. amurensis* vary seasonally and spatially within the estuary, but temperature, salinity, and food availability explain little of the variability. The insensitivity of metabolism to salinity suggests a re-evaluation of the importance of this environmental factor in determining the distribution of *C. amurensis* in the SFE. Measures of energy storage (glycogen) were equally unrelated to the environmental parameters measured. *C. amurensis* did hyperosmoregulate under low salinity conditions, but the potential costs of this activity were not represented in changes in metabolic rate or energy stores. Our current knowledge suggests that under natural food, temperature, and salinity regimes in the SFE, the distribution of adult *C. amurensis* is likely not a consequence of the energetic costs of salinity tolerance. However, the role that food availability plays in modulating salinity tolerance, especially at different temperatures, deserves additional attention.

Statement of Relevance: The distribution of adult *C. amurensis* is likely not due to limited low salinity tolerance. Consequently, anthropogenic alterations to salinity (at least low salinity) will have little impact on adult *C. amurensis* and do not present a viable strategy for eradicating the adults of this species.